

CLAIMS

SJ B17

We Claim:

1. A tool for insertion into bone having cortical bone surrounding an interior volume occupied, at least in part, by cancellous bone, the tool comprising

5 a guide tube,
an expandable body carried by the guide tube in a normally collapsed geometry for insertion into the interior volume,

10 a nozzle carried by the guide tube near the expandable body for insertion into the interior volume with the expandable body,

15 a first lumen in the guide tube communicating with the expandable body to convey medium causing expansion of the expandable body in the interior volume to compact cancellous bone and form a cavity in the interior volume, and

a second lumen in the guide tube communicating with the nozzle to convey a material for discharge from the nozzle into the cavity.

2. A tool according to claim 1
wherein the nozzle is a bone cement injection nozzle.

3. A system for insertion into bone having cortical bone surrounding an interior volume occupied, at least in part, by cancellous bone, the system comprising

5 an expandable body adapted to selectively assume a collapsed geometry for insertion into the interior volume,

10 a nozzle for insertion into the interior volume to occupy the interior volume with the expandable body,

a first element communicating with the

15 expandable body to convey medium causing expansion of the expandable body in the interior volume to compact cancellous bone and form a cavity in the region, and

a second element communicating with the nozzle to convey a material for discharge from the nozzle into the cavity at least partially while the expandable body occupies the interior volume.

4. A system according to claim 3
wherein the nozzle is a bone cement injection nozzle.

5. A method for treating bone comprising the steps of

selecting a body comprising an expandable wall,

5 selecting a nozzle for discharging a material,

inserting both the body and the nozzle into a bone having cortical bone surrounding an interior volume occupied, at least in part, by cancellous bone,

10 causing the body to assume an expanded geometry while occupying the interior volume in the presence of the nozzle to compact cancellous bone and form a cavity in the interior volume, and

15 conveying a material for discharge through the nozzle into the cavity at least partially while the body occupies the interior volume.

6. A method according to claim 5
wherein the conveying step includes conveying bone cement for discharge through the nozzle,

7. A system for treating bone having cortical bone surrounding an interior volume occupied, at least in part, by cancellous bone, the

system comprising

- 5 a first expandable body having a collapsed geometry for insertion into the interior volume through a first access path in cortical bone,
- 10 a second expandable body having a collapsed geometry for insertion into the interior volume through a second access path in cortical bone different than the first access path, and
- 15 the first and second expandable bodies each being adapted to individually assume an expanded geometry for compacting cancellous bone to form a cavity in the interior volume.

8. A system for treating a vertebral body having cortical bone surrounding an interior volume occupied, at least in part, by cancellous bone, the system comprising

- 5 a first expandable body having a collapsed geometry for insertion into the interior volume through a first access path in cortical bone comprising either transpedicular access or postereolateral access,
- 10 a second expandable body having a collapsed geometry for insertion into the interior volume through a second access path in cortical bone different than the first access path, and
- 15 the first and second expandable bodies each being adapted to individually assume an expanded geometry for compacting cancellous bone to form a cavity in the interior volume.

9. A system according to claim 8 wherein the first and second access paths comprise different postero-lateral accesses.

10. A system according to claim 8 wherein the first and second access paths comprise different transpedicular accesses.

11. A system according to claim 8
wherein the first and second access paths
comprise a transpedicular access and a
postero-lateral access.

12. A system for treating bone having
cortical bone surrounding an interior volume
occupied, at least in part, by cancellous bone, the
system comprising an expandable body comprising

5 a first expandable zone having a collapsed
geometry for insertion into the interior volume, the
first expandable zone being adapted to assume an
elongated expanded geometry having a first dimension
extending substantially across the interior volume,
10 to form a barrier within the interior volume, and a
second dimension less than the first dimension, to
leave a region of substantially uncompacted
cancellous bone extending from the barrier within
the interior volume,

15 a second expandable zone having a collapsed
geometry for insertion into the region, the second
expandable zone being adapted to assume an expanded
geometry for compacting cancellous bone to form a
cavity in the region while the barrier serves to
direct expansion of the second expandable zone in
20 the region away from the first expandable zone.

13. A system according to claim 12
wherein the first and second expandable
zones comprise separate expandable assemblies.

14. A system according to claim 12
wherein the first and second expandable
zone comprise parts of a single expandable assembly.

15. A method for treating bone having
cortical bone surrounding an interior volume
occupied, at least in part, by cancellous bone, the
method comprising the steps of

5 selecting a first body comprising an
expandable wall,

 selecting a second body comprising an
expandable wall,

10 inserting the first expandable body into
the interior volume, through a first access path
through cortical bone, and

15 inserting the second expandable body into
the interior volume through a second access path
through cortical bone different than the first
access path, and

20 causing at least one of the first and
second expandable bodies to assume an expanded
geometry while occupying the interior volume, to
compact a region of cancellous bone in the interior
volume about the expandable body to form a cavity in
the region.

16. A method for treating bone having
cortical bone surrounding an interior volume
occupied, at least in part, by cancellous bone, the
method comprising the steps of

5 inserting an expandable body having first
and second expandable zones into the interior
volume,

10 expanding the first expandable zone to form
a barrier within the interior volume while leaving
a region of substantially uncompacted cancellous
bone extending from the barrier within the interior
volume, and

15 expanding the second expandable zone in the
region to compact cancellous bone and form a cavity
in the region while the barrier directs expansion of
the second expandable zone into the region.